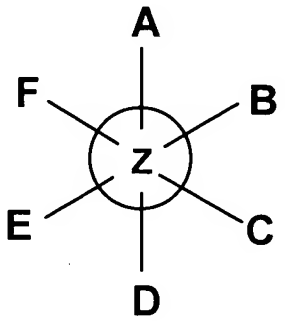
Listing of Claims:

Please make the following amendments to the claims. Material to be inserted is in **bold and underline**, and material to be deleted is in ~~strikeout~~ or (if the deletion is of five or fewer consecutive characters or would be difficult to see) in strikeout and double brackets [[ ]].

Please cancel claim 57 and amend claim 64, without prejudice, as indicated below.

1-31. Canceled

32. (Previously Presented) A composition of matter comprising a photoluminescent compound, the photoluminescent compound having a four-, five-, or six-member aromatic ring Z, with substituents A, B, C, D, E, and F, according to the formula:



wherein F is absent when Z is a five-member ring, and wherein E and F are absent when Z is a four-member ring;

wherein A, B, C, D, E, and F may be present in any order, provided that B and C are adjacent, in which case each of A, D, E, and F is neutral, or provided that B and C

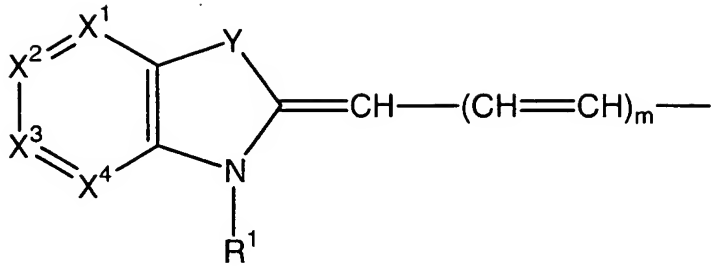
are separated by one of A, D, E, or F, in which case one of A, D, E, and F is negatively charged;

when the A substituent is neutral, A is =O; when the A substituent is negatively charged, A is $-O^-$;

where each D, E, and F substituent, when present and neutral, is independently selected from the group consisting of =O, =S, =Se, =Te, $=N-R^c$, and $=C(R^f)(R^g)$, wherein each of R^c is selected from the group consisting of aliphatic, heteroatom-substituted aliphatic, polyether, aromatic, reactive aliphatic, and reactive aromatic groups, hydrogen, CN, OH, SO_3H, and $COO-R^m$, where R^m is selected from a group consisting of hydrogen, aliphatic substituents, aromatic substituents, reactive aliphatic substituents, reactive aromatic substituents, and linked carriers, and where R^f and R^g are selected from the group consisting of carboxylic acid, cyano, carboxamide, carboxylic ester, and aliphatic amine groups, or, alternatively, or in addition, R^f and R^g, taken in combination, may form 5- and 6-membered rings that include, but are not limited to, pyrazolidine-dione, barbituric acid, thiobarbituric acid, isoxazolone, pyrazolone, pyridone, rhodanine, pyrrolotriazole, and pyrazolotriazole rings;

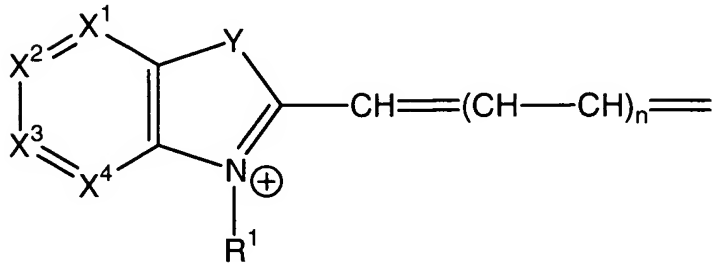
D, E, and F, when present and negatively charged, are independently selected from the group consisting of $-O^-$, $-S^-$, $-Se^-$, $-Te^-$, $-(N-R^c)^-$, and $-(C(R^f)(R^g))^-$;

each B and C substituent is selected from the group consisting of W^1 and W^2, wherein W^1 and W^2 have the respective formulae



W^1

and



W^2

where each B and C substituent is W^1 if B and C are adjacent on Z, and one of B and C is W^1 and the other of B and C is W^2 if B and C are separated by one of A, D, E, and F on ring Z;

m and n are independently selected from the group consisting of 0, 1, and 2;

each Y is independently selected for each of B and C from the group consisting of O, S, N-R^h, and C(R^i)(R^j), wherein R^h is selected from the group consisting of H, aliphatic groups, alicyclic groups, aromatic groups, spacers bound to ionic and reactive groups, and R^i and R^j are selected from the group consisting of H, aliphatic groups, alicyclic groups, aromatic groups, polyether groups, linked carriers, reactive groups capable of covalent attachment to a carrier, spacers bound to one or more reactive groups capable of covalent attachment to a carrier, ionic substituents and spacers containing one or more ionic substituents capable of increasing the hydrophilicity of the entire compound; or R^i and R^j taken in combination form a ring-system that is optionally further substituted by one or more reactive or ionic substituents; provided that at least

one Y is $C(R^i)(R^j)$, and at least one of R^c, R^f, R^g, R^i or R^j includes a reactive group, a linked carrier, or an ionic substituent capable of increasing the hydrophilicity of the entire compound;

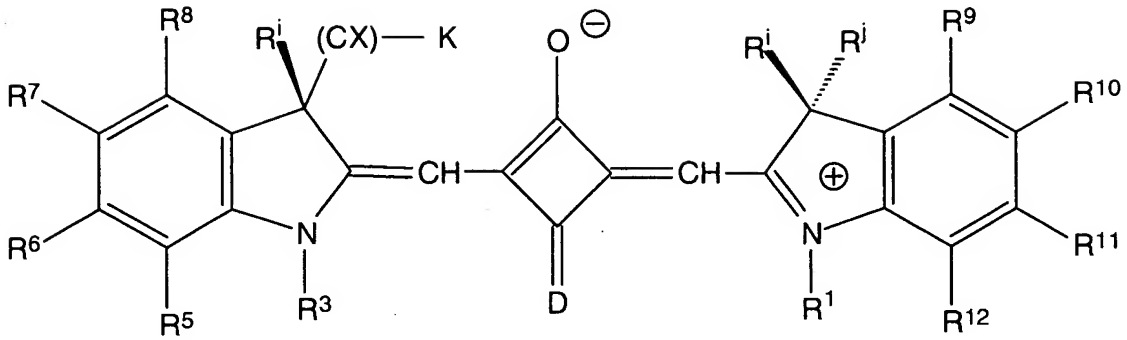
each R^1 is independently selected for each of B and C from the group consisting of H, aliphatic groups, alicyclic groups, aromatic groups, polyether groups, linked carriers, reactive groups capable of covalent attachment to a carrier, spacers bound to one or more reactive groups capable of covalent attachment to a carrier, and ionic substituents capable of increasing the hydrophilicity of the entire compound;

each of X^1, X^2, X^3, and X^4 is independently selected for each of B and C from the group consisting of N, O, S, and C-R^k, wherein R^k is selected from the group consisting of H, F, Cl, Br, I, aliphatic groups, alicyclic groups, aromatic groups, polyether groups, linked carriers, reactive groups capable of covalent attachment to a carrier, spacers bound to one or more reactive groups capable of covalent attachment to a carrier, ionic substituents capable of increasing the hydrophilicity of the entire compound, parts of a condensed aromatic or heterocyclic ring, and parts of a substituted condensed aromatic or heterocyclic ring; and

each H may be independently replaced by a fluorine.

33. (Original) The composition of claim 32, where at least one of R^i and R^j is a reactive aliphatic group.

34. (Previously Presented) The composition of claim 32, wherein the composition has the formula



where D is =O, =S, =Se, =Te, =N-R^c, or =C(R^f)(R^g);

R^1 and R^3 are independently H, -$(CH_2)_k$ –L, or –$(CF_2)_k$-L where k = 1 - 30, and L is one of H, F, Cl, Br, I, CH_2-NH_2, SO_3^-, COOH, and CO-NHS;

R^5 – R^{12} are each independently H, F, SO_3^-, PO_3^{2-}, O-PO_3^{2-}, PO_3R^-, O-PO_3R^-, -$(CH_2)_k$ –L, or –$(CF_2)_k$-L; where k = 1 - 30, and L is one of H, F, Cl, Br, I, CH_2-NH_2, SO_3^-, COOH, and CO-NHS, or SO_3^-, PO_3^{2-} , O-PO_3^{2-}, PO_3R^-, or O-PO_3R^-;

R^i and R^j are H, aliphatic groups, alicyclic groups, aromatic groups, polyethers, linked carriers, reactive groups capable of covalent attachment to a carrier, spacers bound to one or more reactive groups capable of covalent attachment to a carrier, ionic substituents and spacers containing one or more ionic substituents, capable of increasing the hydrophilicity of the entire compound; or R^i and R^j taken in combination form a ring-system that is optionally further substituted one or more time by reactive or ionic substituents;

(CX) is an alkyl chain with 1-22 carbon atoms, a polyether chain, any other polycarbon chain, or a part of a ring system; and

K is COOH, N-hydroxy succinimide, iodoacetamide, maleimide, sulfonychloride, phosphoramidite, SO_3^-, PO_3^{2-} , O-PO_3^{2-}, OH, or NH_2.

35. (Canceled)

36. (Original) The composition of claim 32, wherein at least one of R^i and R^j includes a reactive group selected for reacting with amine moieties from the group consisting of N-hydroxysuccinimidyl esters, isothiocyanates, and sulfonylhalogenides.

37. (Original) The composition of claim 32, wherein at least one of R^i and R^j includes a reactive group selected for reacting with thiol moieties from the group consisting of iodoacetamides and maleimides.

38. (Original) The composition of claim 32, wherein at least one of R^i and R^j includes a reactive group selected for reacting with nucleic acids from the group consisting of phosphoramidites.

39. (Original) The composition of claim 32, wherein at least one of R^i and R^j includes a linked carrier.

40. (Previously Presented) The composition of claim 39, wherein the carrier is selected from the group consisting of proteins, polypeptides, polynucleotides, beads, microplate well surfaces, metallic nanoparticles, and lipids.

41. (Previously Presented) The composition of claim 39, wherein the carrier is a polypeptide, a protein, or a polynucleotide.

42. (Original) The composition of claim 32, wherein at least one substituent of Z includes an ionic substituent selected from the group consisting of SO_3^-, COO^-, PO_3^{2-}, $O\text{-}PO_3^{2-}$, PO_3R^-, $O\text{-}PO_3R^-$ and $N(R^l)_3^+$, wherein R and R^l are aliphatic or aromatic moieties.

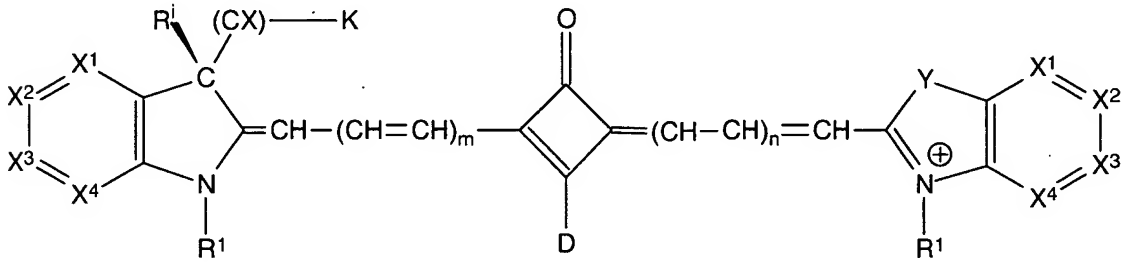
43. (Original) The composition of claim 32, wherein the photoluminescent compound is capable of covalently reacting with at least one of biological cells, DNA, lipids, nucleotides, polymers, proteins, and pharmacological agents.

44. (Original) The composition of claim 32, wherein the photoluminescent compound is covalently or noncovalently associated with at least one of biological cells, DNA, lipids, nucleotides, polymers, proteins, and pharmacological agents.

45. (Original) The composition of claim 32, wherein m and n are 1.

46. (Previously Presented) The composition of claim 32, further comprising a second reporter compound selected from the group consisting of luminophores and chromophores.

47. (Previously Presented) A compound having the formula



wherein D is selected from the group consisting of O^-, S^-, Se^-, Te^-, $N\text{-}(R^c)^-$, and $C(R^f)(R^g)^-$, wherein R^c is selected from the group consisting of aliphatic, heteroatom-substituted aliphatic, polyether, aromatic, reactive aliphatic, and reactive aromatic groups, R^f and R^g are selected from the group consisting of carboxylic acid, cyano, carboxamide, carboxylic ester, and aliphatic amine groups or R^f and R^g taken in combination may form substituted 5- and 6-membered rings;

m and n are independently selected from the group consisting of 0, 1, and 2;

Y is selected from the group consisting of O, S, Se, Te, $N\text{-}R^h$, and $C(R^i)(R^j)$, wherein R^h is selected from the group consisting of H, aliphatic groups, alicyclic groups, aromatic groups, and reactive aliphatic groups, and wherein each of R^i and R^j are H,

aliphatic groups, alicyclic groups, aromatic groups, polyethers, linked carriers, reactive groups capable of covalent attachment to a carrier, spacers bound to one or more reactive groups capable of covalent attachment to a carrier, ionic substituents and spacers containing one or more ionic substituents, capable of increasing the hydrophilicity of the entire compound; or R^i and R^j taken in combination form a ring-system that is optionally substituted by one or more reactive or ionic substituents;

(CX) is an alkyl chain with 1-22 carbon atoms, a polyether chain, any other polycarbon chain, or part of a ring system;

K is selected from the group consisting of COOH, N-hydroxy succinimide, iodoacetamide, maleimide, sulfonychloride, phosphoramidite, SO_3^-, PO_3^-, OH, NH_2, and linked carriers;

each R^1 is independently selected for each of B and C from the group consisting of H, aliphatic groups, alicyclic groups, aromatic groups, linked carriers, reactive groups capable of covalent attachment to a carrier, spacers bound to one or more reactive groups capable of covalent attachment to a carrier, and ionic substituents capable of increasing the hydrophilicity of the entire compound;

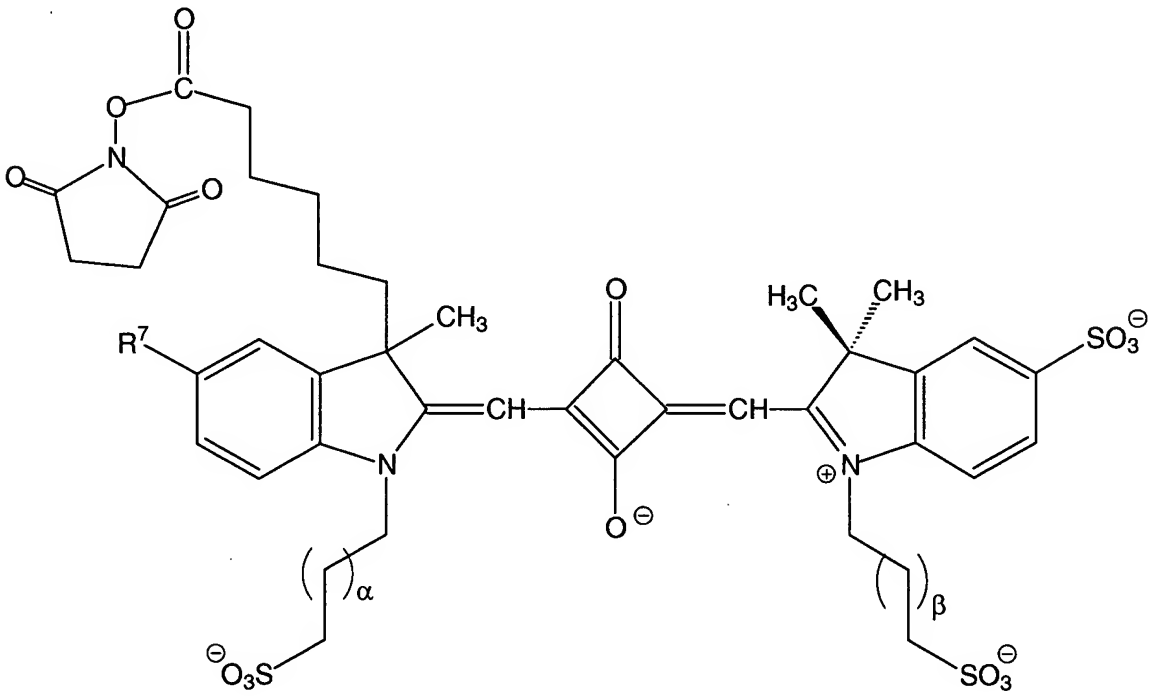
each of X^1, X^2, X^3, and X^4 is independently selected from the group consisting of H, N, O, S, and C-R^k, wherein R^k is selected from the group consisting of H, F, Cl, Br, I, aliphatic groups, alicyclic groups, aromatic groups, linked carriers, reactive groups capable of covalent attachment to a carrier, spacers bound to one or more reactive groups capable of covalent attachment to a carrier, ionic substituents capable of increasing the hydrophilicity of the entire compound, parts of a condensed aromatic or

heterocyclic ring, and parts of a substituted condensed aromatic or heterocyclic ring; and

each H may be independently replaced by a fluorine; and

where D is O^-, the absorption maximum of the compound in aqueous solution is between 600 and 650 nm .

48. (Previously Presented) The composition of claim 32, wherein the composition includes a fluorescent compound having the formula



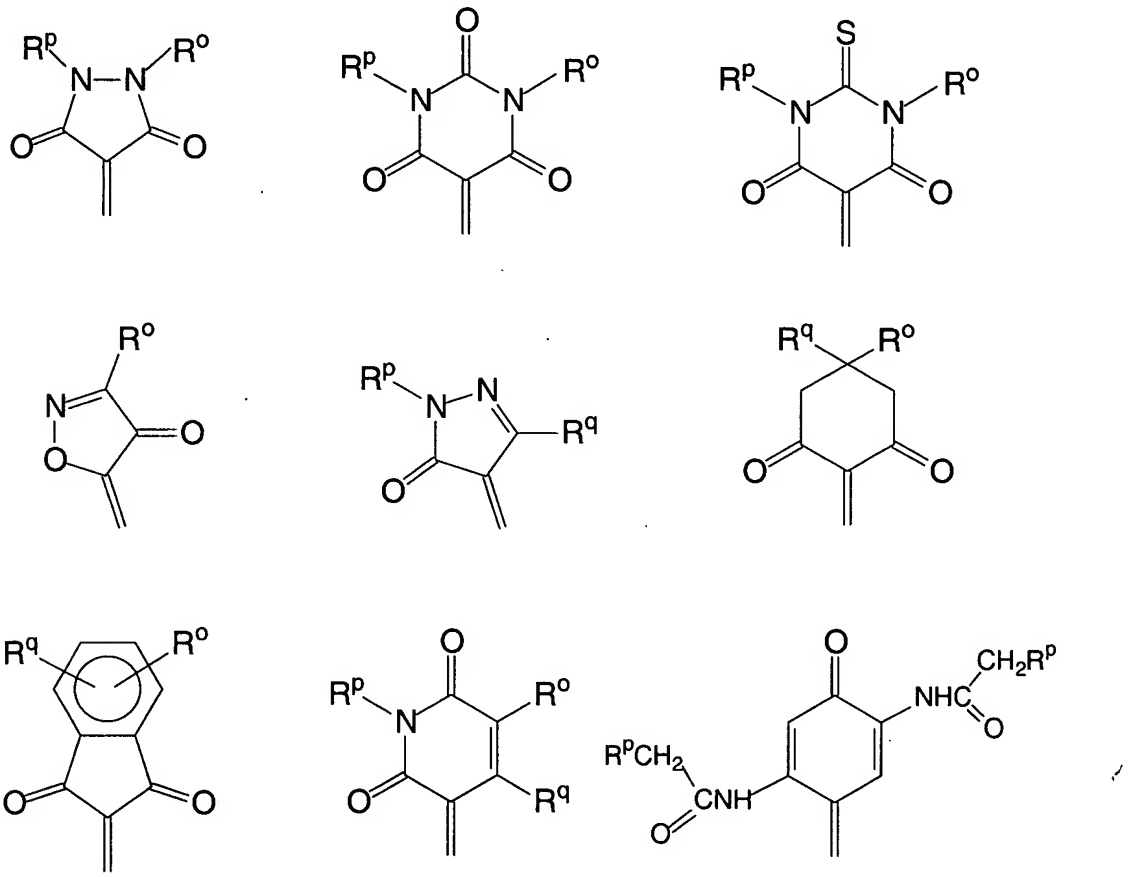
wherein α and β independently are selected from the group consisting of 0, 1, and 2 and R^7 is selected from SO_3^- , H, and CH_3.

49-51. (Canceled)

52. (Previously presented) The composition of claim 32, wherein R^f and R^g, taken in combination, form 5- and 6-membered rings that include a pyrazolidine-dione,

barbituric acid, thiobarbituric acid, isoxazolone, pyrazolone, rhodanine, indanedione, pyridine, or quinone structure.

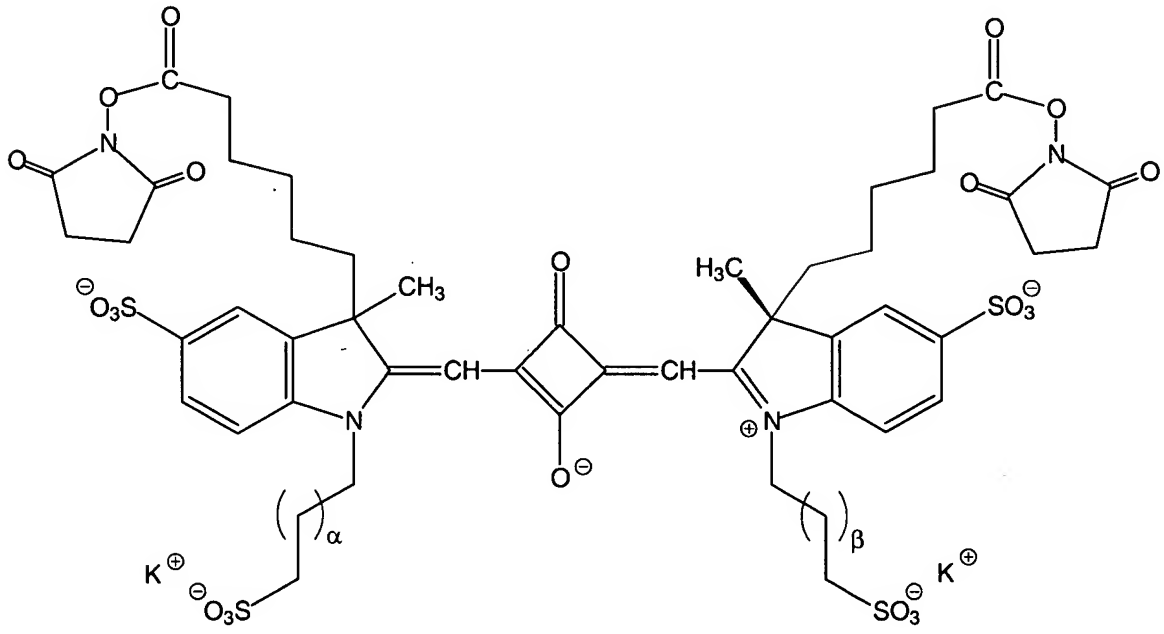
53. (Previously presented) The composition of claim 52, wherein R^f and R^g, taken in combination, form 5- and 6-membered rings that include the pyrazolidine-dione, barbituric acid, thiobarbituric acid, isoxazolone, pyrazolone, rhodanine, indanedione, pyridine, and quinone structures below:



wherein R^p, R^o are selected from the groups of H, aliphatic, reactive aliphatic, aromatic, reactive aromatic groups and linked carriers; R^q is selected from COOH, $CONHR^n$, $COOR^n$, CN, SO_3^-, PO_3^-, wherein R^n is selected from a group consisting of hydrogen,

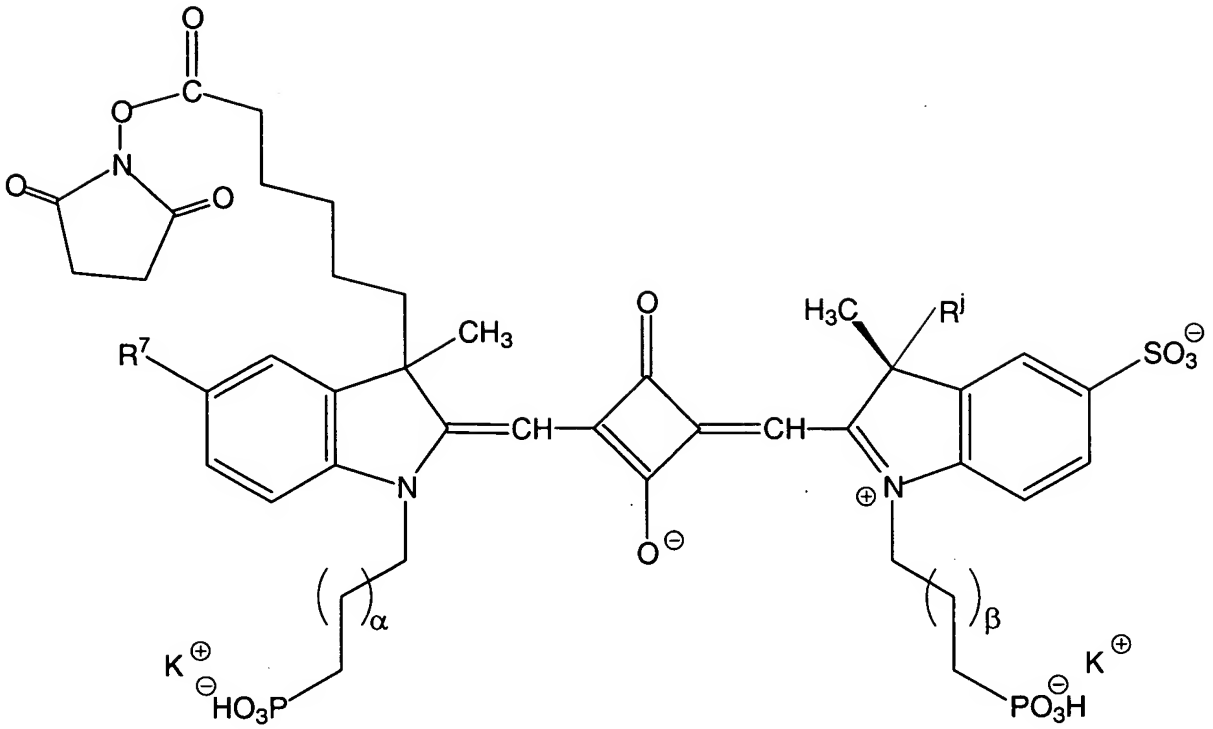
aliphatic substituents, aromatic substituents, reactive aliphatic substituents, reactive aromatic substituents, and linked carriers.

54. (Previously Presented) The composition of claim 32, wherein the composition includes a compound having the formula



where α and β independently are selected from the group consisting of 0, 1, and 2.

55. (Previously Presented) The composition of claim 32, wherein the composition includes a compound having the formula



where α and β independently are selected from the group consisting of 0, 1, and 2, and R^7 is selected from SO_3^-, H, and CH_3.

56. (Previously Presented) The composition of claim 32, wherein A is O^-, D is O, and the absorption maximum of the compound in aqueous solution is between 600 and 650 nm.

57 (Canceled)

58. (Previously Presented) The composition of claim 32, wherein Z is based on squaric acid, croconic acid, or rhodizonic acid.

59. (Previously Presented) The composition of claim 46, wherein one of the first and second reporter compounds is an energy transfer acceptor and the other of the first and second reporter compounds is a corresponding energy transfer donor.

60. (Previously Presented) A protein-conjugate of the compound of claim 48.

61. (Previously Presented) A protein-conjugate of the compound of claim 54.

62. (Previously Presented) A protein-conjugate of the compound of claim 55.

63. (Previously Presented) A conjugate of claim 44 further including a metallic nanoparticle, which influences the photophysical properties of the luminescent molecule at a certain distance.

64. (Currently Amended) The composition of claim ~~56~~ **63**, wherein binding between the dye-conjugate and the nanoparticle is facilitated via a specific binding pair.

65. (Previously Presented) The claim of 64, wherein the specific binding pair is selected from the group consisting of antigens and antibodies, ligands and receptors, biotin and streptavidin, lectin and sugar, protein A and antibodies, and oligonucleotides and complementary oligonucleotides.